

Several years ago, Marshall Space Flight Center engineer Frank Nola came up with a way to curb power wastage in AC induction motors caused by the fact that such motors operate at a fixed voltage, the voltage necessary to handle the heaviest loads the motor is designed to carry. The wastage occurs when the motor is operating at less than full load but is still getting full load power. Nola's answer was a device called the Power Factor Controller (PFC) that matches voltage with the motor's actual need. Plugged into a motor, the PFC continuously determines motor load by sensing shifts between voltage and current flow; when it senses a light load it cuts the voltage to the minimum needed. It offers potential energy savings ranging from eight percent all the way up to 65 percent, depending on the type of application.

Considering the millions of electric motors in service and the rising cost of energy, it was not surprising that Nola's invention excited broad interest and became one of the most widely used NASA spinoffs. A user example of particular interest is



the experience of Myles H. Marks, then a Pittsburgh (Pennsylvania) television broadcast engineer who started out with the notion of doing a magazine article about the PFC and wound up with a thriving garage industry selling controller kits in volume.

Marks learned of the PFC from a TV broadcast and hit upon the idea of writing an article for *Popular Electronics* magazine and at the same time offering to furnish kits to readers interested in assembling their own PFCs. The editor of *Popular Electronics* was enthusiastic about the project, so Marks began gathering information.

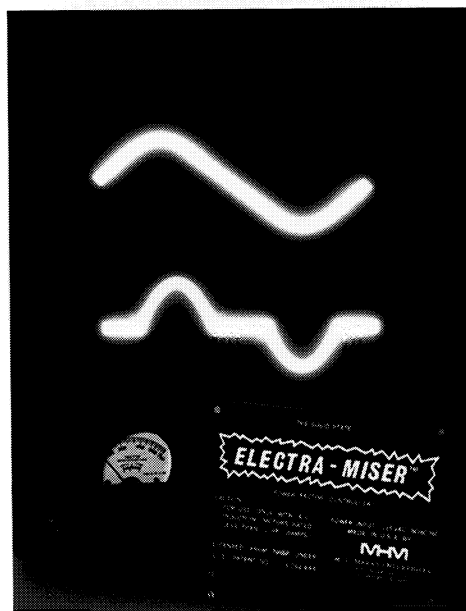
He contacted the NASA Industrial Applications Center at Pittsburgh, which supplied him a detailed technical information package and advised him how to obtain a NASA license. Marks got the license, developed his own prototype and patented it as the Electra-Miser™, a unit designed to cut power up to 40 percent in typewriters, washing machines, refrigerators and similar equipment. With NASA

help, he also lined up suppliers for the various components of the Electra-Miser kit.

When the *Popular Electronics* article appeared, Marks was stunned by the response. Within two weeks he had orders for 500 kits and the orders kept coming over a three-year span. He used his garage as a kit assembly plant and the rest of the house as a warehouse, and turned out some 2,500 kits. Marks is shown above with an Electra-Miser (black

box) installed on a home heating blower unit; below is the normal sine wave of the electrical current and the power savings (blue) the Electra-Miser makes possible by interrupting the cycle.

In time the PFC technology spread widely and, as many new suppliers entered the field, demand for the Electra-Miser fell off, but Marks still maintains a supply of parts and builds Electra-Misers on special demand.



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